

Overview of Green Bonds

Growing Asset Class in the Muni Market

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What are Green Bonds?

Green Bonds are a growing asset class within fixed income markets globally

This includes within the \$4 trillion municipal market

Despite the growth in issuance over the last decade, and the growth of interest from investors, there is no one standard definition of a Green Bond

One common definition: Green Bonds are bonds issued to fund environmentally beneficial projects

The global leader in issuance of Green Bonds is the World Bank, having issued \$10 billion since 2018

The World Bank uses proceeds to exclusively focus on projects expected to have a positive impact on climate change

But like the lack of a single definition, there is no standard set of eligible projects for Green Bonds to fund

For example, in the U.S. municipal issuers have used Green Bonds to preserve open space, clean up brownfield projects, conserve energy and water, fund renewable energy projects, and enhance mass transit options

Question for participants: is the lack of standard definitions a concern?

The California State Treasurer has taken a leadership role in promoting common standard and terms

Why Issue Green Bonds?

- I. Environmental benefits and public policy objectives
- II. Pricing advantage
- III. Grow and diversify your investor base
- IV. Bottom-up capital budgeting

Why do investors care?

New investing dynamics are helping to drive the demand for Green Bonds

- Investors have more choices today in terms of investments
- Investors want the ability to direct their investments
- More focus on and awareness of environmental issues today
- Greater sense of commitment in investing

Can Issuers Get “Paid” for Green Bonds

New research focusing on the municipal bond market indicates that issuers can get “paid” by the market for issuing Green Bonds

To wit, Green Bonds are issued at a premium to otherwise ordinary bonds - that is, with lower yields on an after-tax basis

They estimate the pricing advantage at six basis points, or an amount equal to about half of a bond credit rating notch, according to their study

The pricing advantage is even stronger when the bonds are certified by a third party

Financing the Response to Climate Change: The Pricing and Ownership of U.S. Green Bonds*

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Abstract

Estimates suggest that mitigating and adapting to climate change will cost trillions of dollars. We study the developing market for green bonds, which are bonds whose proceeds are used for environmentally sensitive purposes. After an overview of the U.S. corporate and municipal green bonds market, we study pricing and ownership patterns of municipal green bonds using a framework that incorporates assets with nonpecuniary sources of utility. The results support the prediction that green bonds are issued at a premium to otherwise similar ordinary bonds—that is, with lower yields—on an after-tax basis. They also support the prediction that green bonds are more closely held than ordinary bonds, particularly small or essentially riskless green bonds. Both pricing and ownership effects are stronger for bonds that are externally certified as green.

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The research also indicates a big opportunity to find new investors

Green Bonds ownership tends to be concentrated with investors who are not just seeking yield, but also seek to invest with some measure of social responsibility

“A subset of investors appears willing to sacrifice some return to hold green bonds, particularly ‘certified’ green bonds. Green bonds are held disproportionately by these investors.”

To put it another way, if you issue Green Bonds there is a good chance your bonds find their way to new investors

That diversification is very valuable over the long-term

Sample List of Green Bond Investors

Blackrock - Trillium - State Street

Lincoln Financial Group - Fireman’s Fund - Prudential

Boston Trust - AIG - Allianz

Swiss Re - AIA - The Hartford

Allstate - Munich Re - Calvert

Conning - Swiss Re - Zurich

Market Trends for Green Bonds

Since the Commonwealth of Massachusetts brought the first \$100 million to market in 2013, issuance of Green Bonds has soared

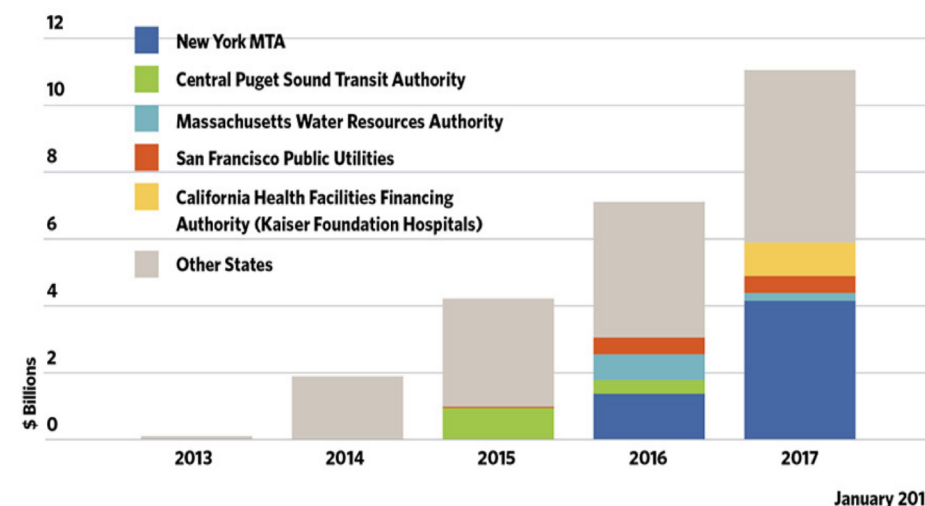
More than \$11 billion in the debt was sold in 2017, up from just over \$7 billion the previous year

The largest issuer is the New York Metropolitan Transportation Authority, followed by the State of California

Other issuers include Central Puget Sound Transit Authority, San Francisco Public Utilities Commission, and the California Health Facilities Financing Authority

Top 5 US Municipal Green Bond Issuers

Climate Bonds INITIATIVE



Source: <https://www.climatebonds.net/2018/01/record-usd11bn-us-green-muni-bonds-2017-ny-top-spot-beats-california-usd20bn-2018-forecast>

In terms of the issuance process itself, issuers really need to focus on three things:

First, they have to clearly define what they are considering a Green Bond. This includes a clean definition in the POS/OS

Second, they have to clearly outline their process and criteria for selecting environmentally beneficial projects to be financed by the Green Bonds. How did you select these projects?

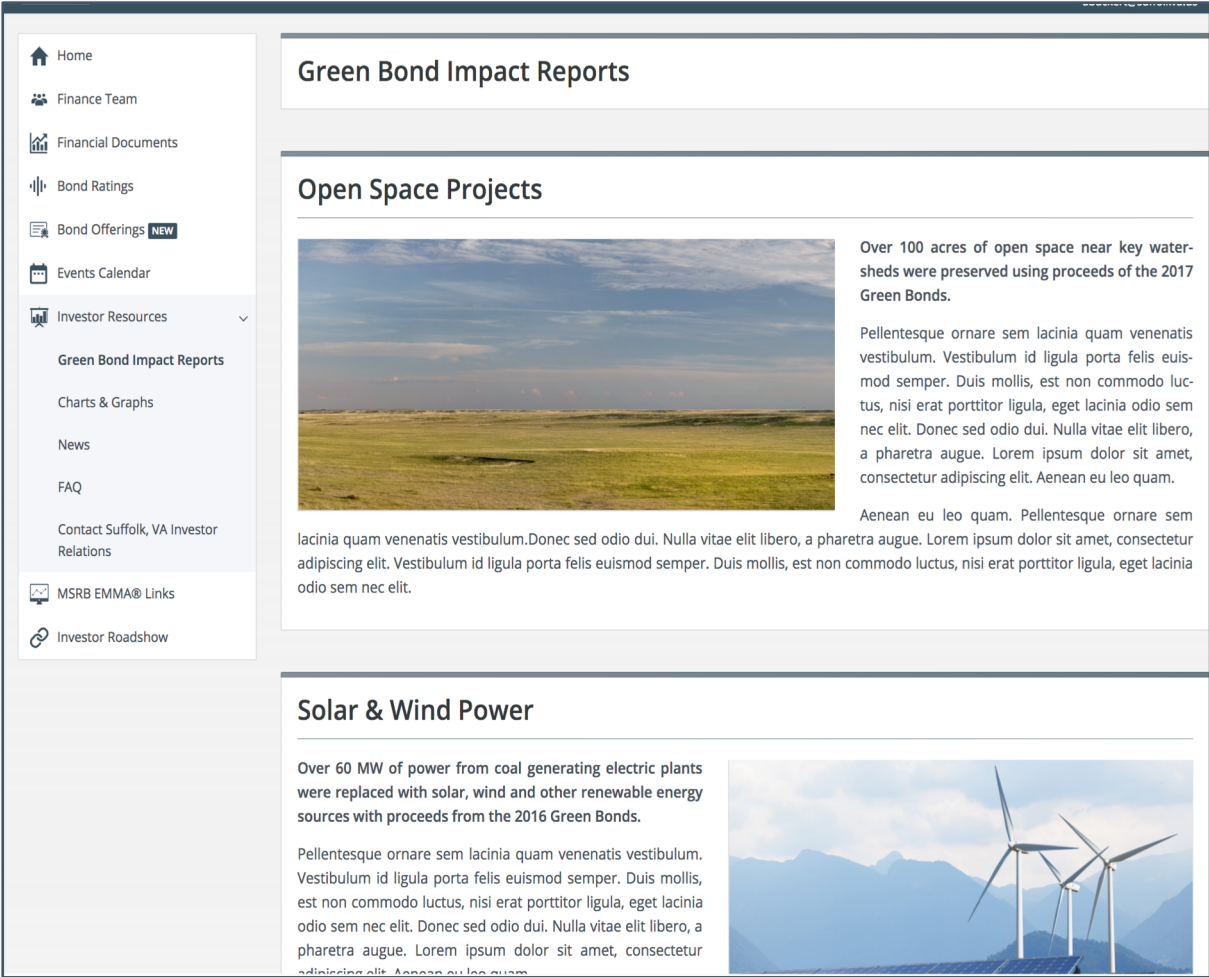
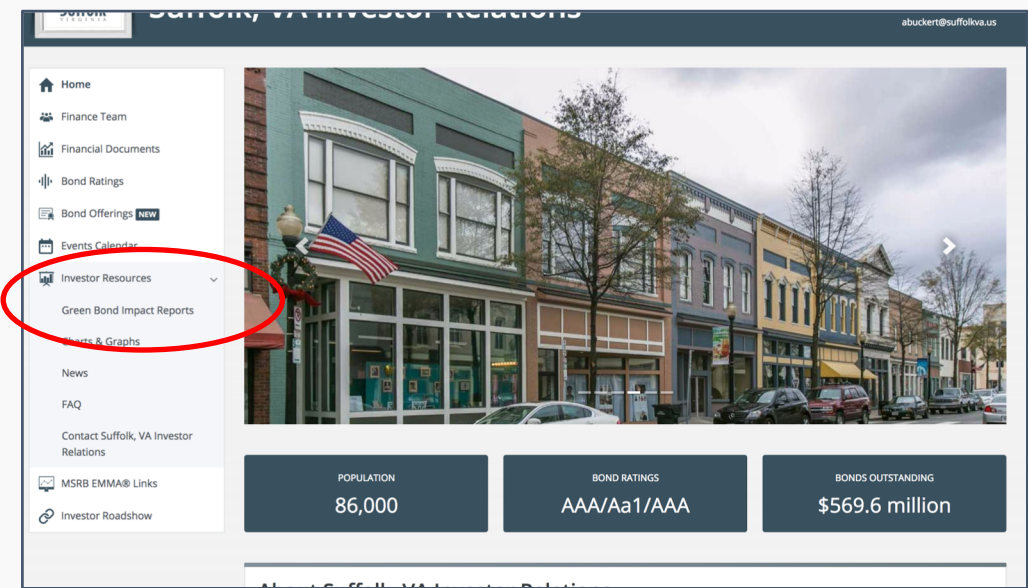
Third, and most importantly, they have to be committed to providing ongoing impact reports to Green Bond investors

How many acres of open space were preserved? How many gallons of water were cleaned? How many miles of new transit were created?

Post-Issuance Impact Reporting

After the sale of Green Bonds, impact reporting of the environmental benefits of the projects is critical

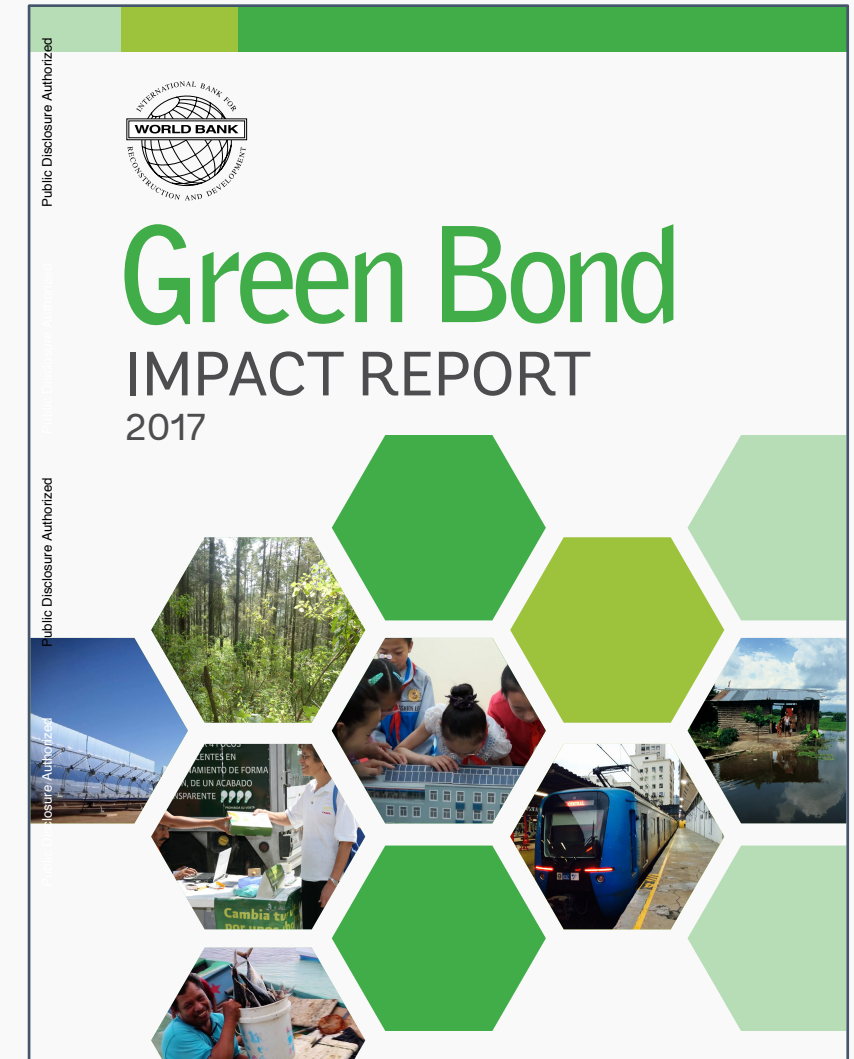
This includes ongoing impact reporting, as well as annual cumulative reporting



Post-Issuance Impact Reporting (con't)

The World Bank's annual impact report is widely considered the gold standard by investors

For both interim / ongoing reporting, as well as annual or cumulative reporting, the key is easy, repeatable and scalable dissemination to investors and other stakeholders



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